

**A SUSTAINABLE GEOSPATIAL DATA  
INFRASTRUCTURE  
FOR  
INTEGRATION & INTEROPERABILITY**

**Col Sunil Mishra**

# Digital Revolution

**Convergence of Technologies**

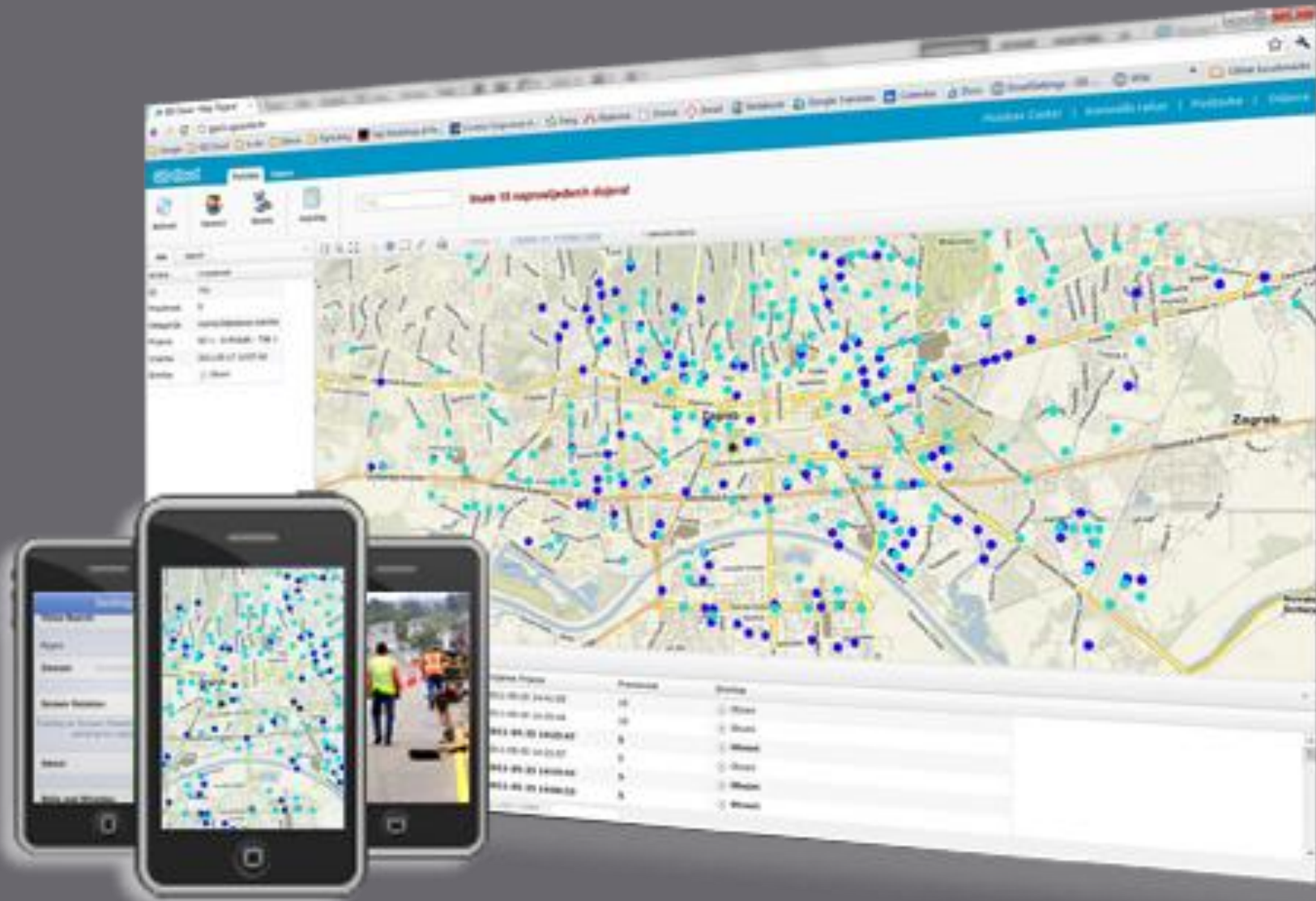


**Growth of IT Sector**



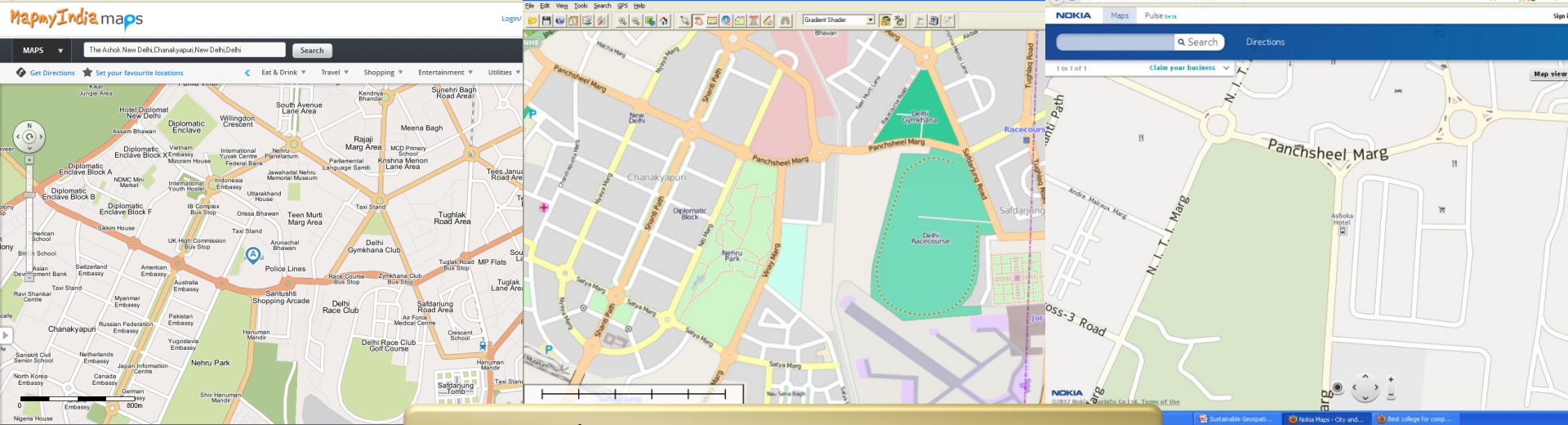
**Shift to E - Governance**

# Increasing Geospatial Awareness





# Increasing Geospatial Awareness



Online Maps & Imagery

Vehicle Navigation

Location Based Services





# Perceptible Shift



**Paper Maps in the Background**





# Geospatial Data in Public Domain



Huge Database



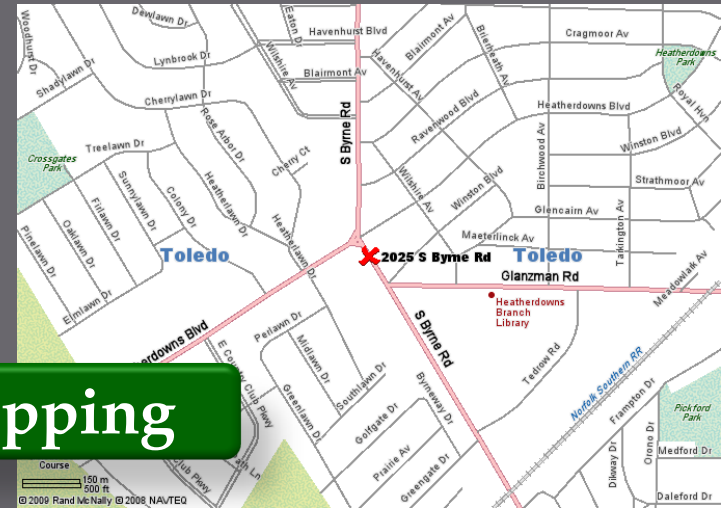
Challenges the Policies of Governments World Over

High Levels of Detail

Increasingly Accurate



Community Based Mapping



# Geospatial Data for Agencies Entrusted with National Security

- ▣ Stringent security requirements : Operational Systems can NOT be connected on public networks.
- ▣ Geospatial data goes beyond Imagery and Maps; and much beyond that available in public domain.
- ▣ Frequency of update much higher.
- ▣ Difference between 'Base Geospatial Data' and user generated operational overlays.
- ▣ Integration & Interoperability affected by both.

# Base Geospatial Data

- Multiple sources and sensors with varying Spatial, Spectral and Temporal Resolutions.
- Aerial Platforms & UAVs.
- Analyzed inputs.
- HUMINT inputs, Terrestrial Sensors.
- Attributes collected on ground.

**Beyond Traditional Approach**



Elevation Model

Vector Map

Raster Map

Satellite Image



# Topographic Data

- ▣ **Vintage, yet provides substantial information.**
- ▣ **Not prepared for GIS exploitation.**
- ▣ **No easy automated solution to convert to GIS ready database.**
- ▣ **Not structured for query and analysis.**

# Handling of Base Geospatial Data

- ▣ Pre-Processing of data by each agency.
- ▣ Datum & Projection conversion.
- ▣ Varying vintage of data across organizations.
- ▣ Different sets of attributes.
- ▣ Leads to 'Uncommon' base data.



# Standards for Base Data

- Differing operating environment.
- Vast disparity in communication infrastructure at HQs and in Combat Zones.
- Granularity required at various levels.
- Varied software implementations.
- Necessity of data sharing.

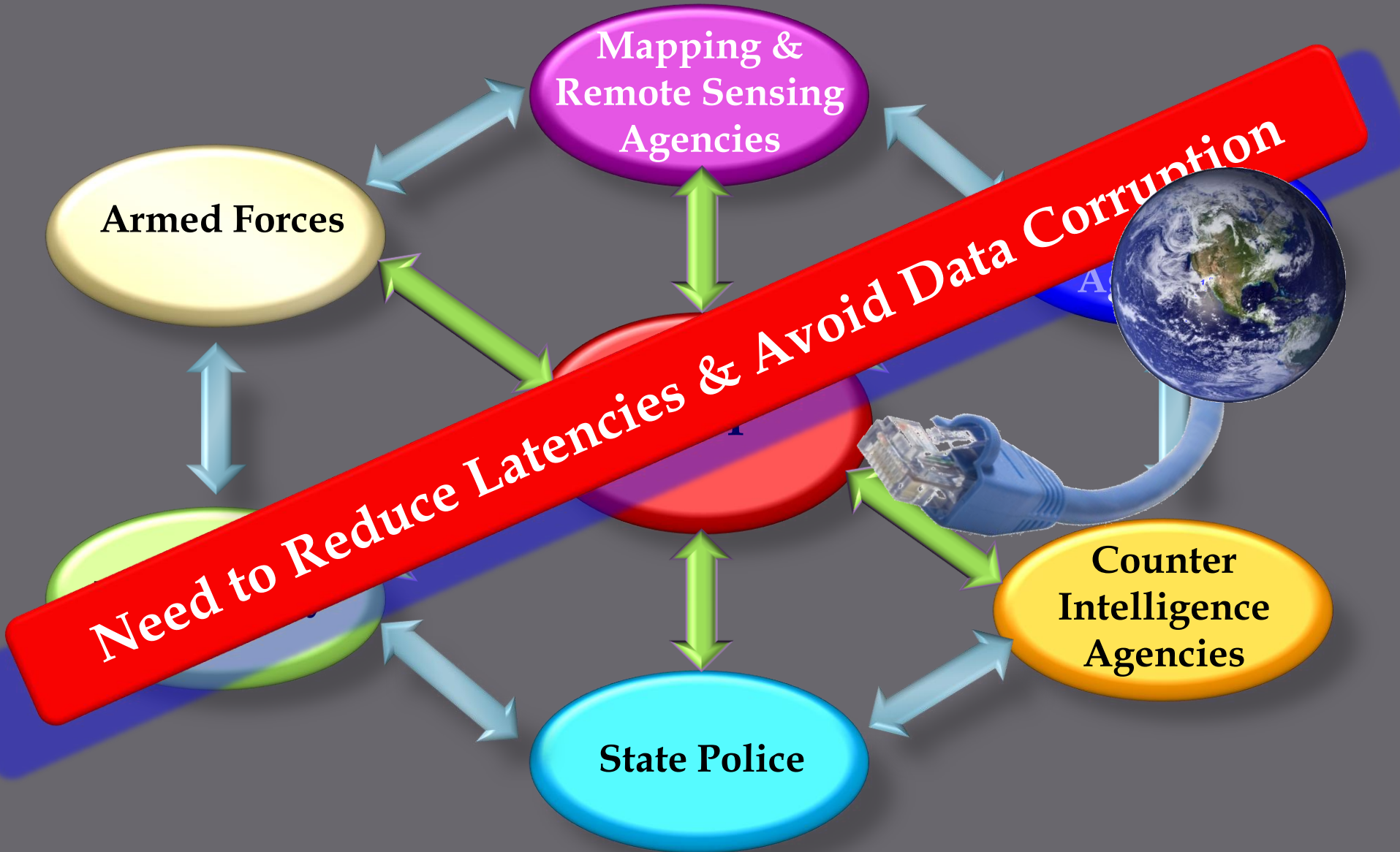


# Base Geospatial Data : Challenges

- ▣ Geospatial Data Infrastructure : Sustainability.
- ▣ Data collection policies and procedures.
- ▣ Duplication of effort.
- ▣ Identification of the highest level of granularity for data collection.
- ▣ Organizing data in a suitable 'Data Model Structure'.
- ▣ Developing a 'Data Dissemination Model'.



# Data Collection & Dissemination



# Standards

- ▣ Numerous commercial solutions.
- ▣ Proprietary nature of most prevents exploitation.
- ▣ OGC : Not a 'Magic Wand'.
- ▣ Open standards?.
- ▣ A robust and workable schema still required for efficiency.



# User Generated Operational Data



Graphics

Attributes



Symbols



# User Generated Operational Data

- ▣ Not a GIS function alone.
- ▣ COTS applications do not provide 'Out of the Box' tools for handling military symbols.
- ▣ A 'Data Model Structure' equally relevant in this domain.
- ▣ Need to identify the 'Areas of Commonality' across agencies and organization.



# Challenges in Creating Sustainable Geospatial Infrastructure

- ▣ Differing perceptions : Accepting the need.
- ▣ Comfort Zones; Resistance to change.
- ▣ Scope of work; Need for 'Higher Resolution, Larger Scale' datasets.
- ▣ Technology proliferation.
- ▣ Security Paranoia.
- ▣ Breaking the 'Silos'.
- ▣ Data Sharing.



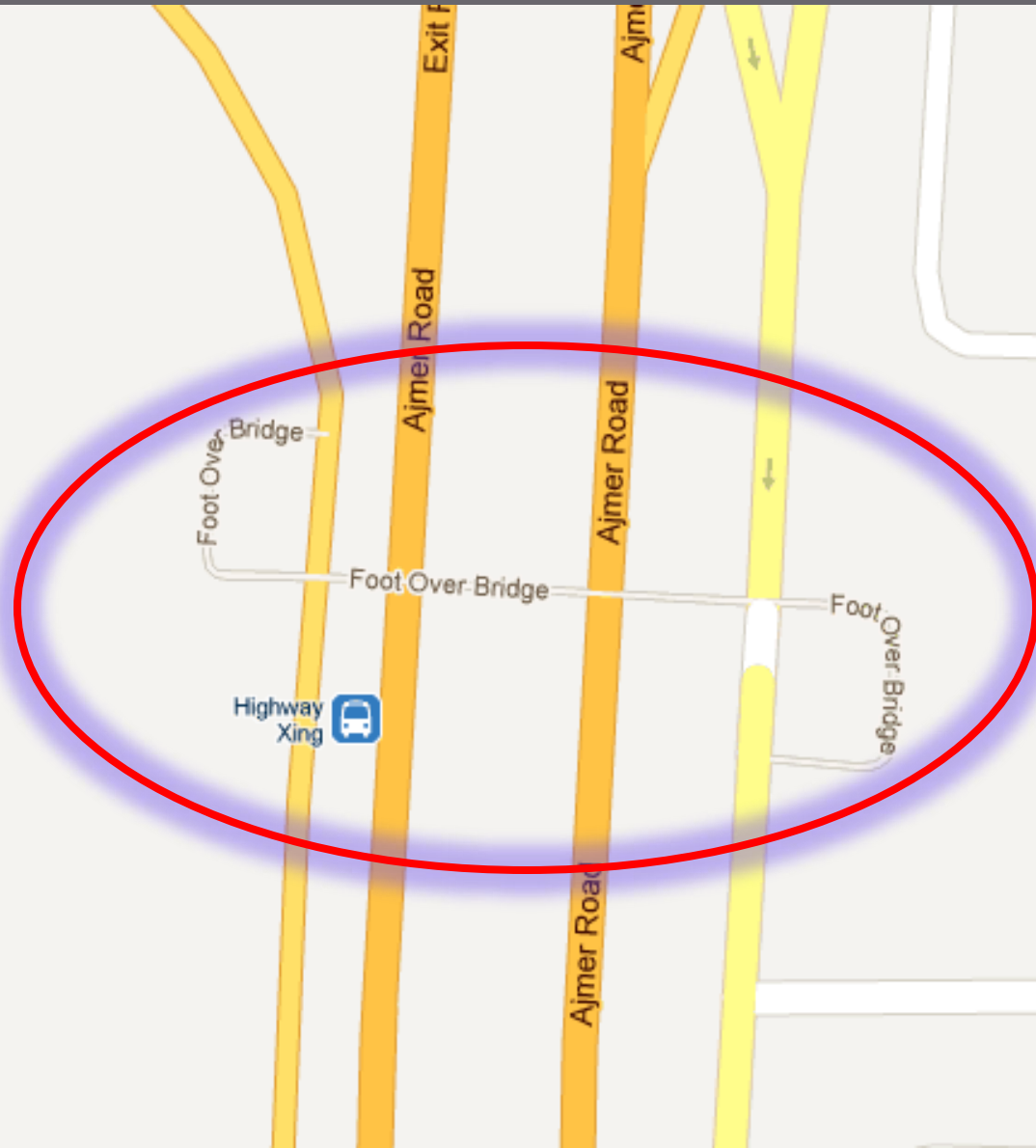
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# Need for Change





# Conclusion

- ▣ Policies would remain the driving force.
- ▣ Integrated top down approach.
- ▣ Security concern; restrictions on adopting random protocols & standards.
- ▣ Industrial capability & a better informed user.
- ▣ Technology not an impediment.

